IN THE CLAIMS

1. (Currently Amended) An isolated graphitic polyhedral crystal comprising graphite sheets arranged in a plurality of layers to form an elongated structure having a long axis and a diameter and having 7 or more external facets running substantially the length of the long axis, wherein the diameter is from 5nm to 1000nm and the external facets are of substantially equal size, and wherein the crystal is in a form selected from the group consisting of needles, giant nanotubes, rings, cones, double tipped pyramids, nanorods and whiskers.
2. (Original) The isolated graphitic polyhedral crystal of claim 1, wherein the crystal has from 7 to 14 external facets.
3. (Original) The isolated graphitic polyhedral crystal of claim 2, wherein the crystal has 7, 9 or 11 external facets.
4. (Original) The isolated graphitic polyhedral crystal of claim 3, wherein the crystal has 9 external facets.
5. (Cancelled)
6. (Original) The isolated graphitic polyhedral crystal of claim 1, wherein said long axis is from 100 nm to 5 microns in length.
7. (Cancelled)
8. (Original) The isolated graphitic polyhedral crystal of claim 1, wherein said external facets run axially true.
9. (Original) The isolated graphitic polyhedral crystal of claim 1, wherein said external facets undergo at least a partial helical twist along the length of the long axis.
10. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a needle.

11. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a giant nanotube.

12. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a ring.

13. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a cone.

14. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a double tipped pyramid.

15. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a nanorod.

16. (Currently Amended) The isolated graphitic polyhedral crystal of claim ~~7~~ 1, wherein the crystal is in the form of a whisker.

Claims 17-26 (Cancelled).

27. (Original) A microscopy probe comprising a graphitic polyhedral crystal having a plurality of graphite sheets arranged in a plurality of layers to form an elongated structure having a long axis and a diameter and having 7 or more external facets running substantially the length of the long axis, and having protruding from one end thereof a nanotube.

28. (Original) A nanoscale gear assembly, comprising a graphitic polyhedral crystal comprising graphite sheets arranged in a plurality of layers to form an elongated structure having a long axis and a diameter and having 7 or more external facets running substantially the length of the long axis, wherein the crystal is in the form of a ring having a hollow center, through which is placed a nanorod as an axle.

Claims 29-30 (Cancelled).

31. (Currently Amended) A reinforced matrix composite, comprising a matrix and a reinforcement, wherein said matrix is a member selected from the group consisting of ceramics, metals and polymers, and wherein said reinforcement is a graphitic polyhedral crystal comprising graphite sheets arranged in a plurality of layers to form an elongated structure having a long axis and a diameter and having 7 or more external facets running substantially the length of the long axis, wherein the diameter is from 5nm to 1000nm and the external facets are of substantially equal size, and wherein the crystal is in a form selected from the group consisting of needles, giant nanotubes, rings, cones, double tipped pyramids, nanorods and whiskers.

32. (Original) The reinforced matrix composite of claim 31, wherein the crystal has from 7 to 14 external facets.

33. (Original) The reinforced matrix composite of claim 32, wherein the crystal has 7, 9 or 11 external facets.

34. (Original) The reinforced matrix composite of claim 33, wherein the crystal has 9 external facets.

35. (Cancelled).

36. (Original) The reinforced matrix composite of claim 31, wherein said long axis is from 100 nm to 5 microns in length.

37. (Cancelled).

38. (Currently Amended) ~~The reinforced matrix composite of claim 31,~~ A reinforced matrix composite, comprising a matrix and a reinforcement, wherein said matrix is a member selected from the group consisting of ceramics, metals and polymers, and wherein said reinforcement is a graphitic polyhedral crystal comprising graphite sheets arranged in a plurality of layers to form an elongated

structure having a long axis and a diameter and having 7 or more external facets running substantially the length of the long axis, wherein said external facets run axially true.

39. (Original) The reinforced matrix composite of claim 31, wherein said external facets undergo at least a partial helical twist along the length of the long axis.

40. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a needle.

41. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a giant nanotube.

42. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a ring.

43. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a cone.

44. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a double tipped pyramid.

45. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a nanorod.

46. (Currently Amended) The reinforced matrix composite of claim ~~37~~ 31, wherein the crystal is in the form of a whisker.

47. (Original) The reinforced matrix composite of claim 31, wherein the matrix is a ceramic.

48. (Currently Amended) ~~The reinforced matrix composite of claim 31~~A reinforced matrix composite, comprising a matrix and a reinforcement, wherein said matrix is a member selected from the group consisting of ceramics, metals and polymers, and wherein said reinforcement is a graphitic polyhedral crystal

comprising graphite sheets arranged in a plurality of layers to form an elongated structure having a long axis and a diameter and having 7 or more external facets running substantially the length of the long axis, wherein the matrix is a metal.

49. (Original) The reinforced matrix composite of claim 31, wherein the matrix is a polymer.